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COMPLETE SPECIFICATION

Cosmetic and Topical Pharmaceutical Compositions Comprising a Lactalbumin Hydrolysate

We, NESTLE'S PRODUCTS LIMITED, a Company incorporated in the Bahama Islands, of Peek Building, George Street, Nassau, Bahama Islands, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention is concerned with compositions useful in the treatment of the skin.

In accordance with the present invention, it has been found that certain mixtures of amino acids, particularly those obtained by enzymatic hydrolysis of milk proteins such as lactalbumin, have a very favourable action on the skin.

In particular, it has been found that such amino acid mixtures may be successfully used for treating skin which has been damaged or infected, for example, in cases of burns and cuts, and also for skin conditions such as eczema and acne. It has also been found that said amino acid mixtures have the property of nourishing the skin, and hence may be used as active ingredient in various cosmetic preparations.

Furthermore, it has been observed that the amino acid mixture is easily absorbed by the skin when it is applied thereto in aqueous solution, in the form of a oil-in-water emulsion.

The present invention accordingly provides compositions adapted for topical administration comprising an enzymatic lactalbumin hydrolysate as active ingredient in conjunction with an inert carrier, said carrier being a oil-in-water type emulsion in which the active ingredient is present in the aqueous phase.

The compositions according to the present invention may be presented in different forms, depending on their intended method of application. Thus, for example, for therapeutic purposes, the composition may conveniently take the form of ointments, creams and pomades.

For cosmetic purposes, the compositions may advantageously be presented in the form of lotions or milks; however, creams are also suitable.

Depending on their intended use, the compositions may contain different quantities of active ingredient. Thus, compositions destined for therapeutic purposes may conveniently contain about 5% by weight of active ingredient, whereas in compositions essentially destined for cosmetic use the level of active ingredient is preferably about 2.5% by weight. However, the amounts may conveniently vary from 1% to 10% by weight, preferably 2.5 to 5% by weight.

The compositions according to the invention may be prepared by conventional methods. For example, the active ingredient may first of all be dissolved in a suitable quantity of water, and the solution may then be emulsified in a suitable ointment base. The term "ointment base" as used herein is not intended to be restricted to bases specifically intended for ointments, but should be understood to mean any fatty base in which the solution of active ingredient may be emulsified. It may be pastelike, semi-fluid or fluid. Of course, the base should be inert towards the skin. Examples of substances which may be used as the fatty base, either singly or in combinations, are cetyl alcohol, lanolin, petroleum jelly, liquid paraffin and polyoxyethylene sorbitan esters, such as the palmitates, oleates and stearates.

Preferably, the base comprises fatty acid triglycerides containing liposoluble vitamins,

long-chain fatty alcohols, branched-chain fatty acid esters and monoglycerides having emulsifying properties. It is advantageous that the chemical composition of the base be as close as possible to that of the sebum. If desired, one or more emulsifying agents may be incorporated in the compositions according to the invention.

In addition to the lactalbumin hydrolysate active ingredient, the compositions may also contain, either in the fatty or in the aqueous phase, antimicrobial, bactericidal and/or fungicidal agents of the type which are normally employed in dermatology. Preferably, the pH of the aqueous phase is within the limits 5.9 to 6.2. If desired, antioxidants, colouring matters and/or perfumes may also be incorporated in the compositions.

The compositions may be presented in different forms, the actual presentation being chosen in relation to the use of the composition. Creams and ointments may be packed in tins or tubes; lotions may be presented in flasks or sachets or in aerosol-type containers, using conventional propellants. Aerosol foams may also be prepared.

As previously indicated, the compositions according to the invention are useful both for therapeutic and cosmetic purposes. Thus, for example, the compositions may be used for the treatment of cuts, of burns caused by acids, alkalis, hot objects and flames, of inflammations caused by excessive exposure to the sun, insect bites, rashes, acne and eczema seborrhoicum.

For cosmetic purposes, the compositions may be used as nourishing lotions and creams, and also as baby lotions for protecting the skin against nappy rash.

The lactalbumin hydrolysate used as active ingredient in the compositions according to the present invention may be prepared by conventional enzymatic hydrolysis using, for example, pancreatin, trypsin, erapsin, chymotrypsin, ficin, bromelin and various fungal enzymes.

An enzymatic lactalbumin hydrolysate having the following approximate composition (% by weight) is particularly suitable:—

Alanine	4.7
Ammonia	1.3
Arginine	3.0
Aspartic acid	9.5
Cystine	1.5
Glutamic acid	16.3
Glycine	1.7
Histidine	1.7
Iso-leucine	4.8
Leucine	10.4
Lysine	9.0
Methionine	1.8
Phenylalanine	3.0
Proline	3.9
Serine	3.7
Threonine	4.3
Tryptophane	1.6
Tyrosine	3.1
Valine	4.5
Ash	3.5

The following examples are given for the purposes of illustration only. The parts are parts by weight unless stated otherwise.

Example 1

A fatty phase and an aqueous phase are prepared as follows:

(a) fatty phase

8 parts of cetyl alcohol and 4 parts of lanolin (adeps lanae anhyd.) are melted in a jacketed kettle. When a clear liquid is obtained, the following fat-soluble substances are added: 6 parts of corn oil, 3 parts of petroleum jelly Ph.H.V., 2 parts of branched chain fatty acid esters and 12 parts of polyoxyethylene sorbitan monostearate/monopalmitate mixture as fatty excipient and emulsifying agent. This fatty mixture is maintained at 70°C.

(b) aqueous phase

5 parts of an amino acid mixture (obtained by hydrolysis of lactalbumin with pancreatin) having the following approximate composition:

Alanine	4.7%
Ammonia	1.3%
Arginine	3.0%
Aspartic acid	9.5%
Cystine	1.5%
Glutamic acid	16.3%
Glycine	1.7%
Histine	1.7%
Iso-leucine	4.8%
Leucine	10.4%
Lysine	9.0%
Methionine	1.8%
Phenylalanine	3.0%
Proline	3.9%
Serine	3.7%
Threonine	4.3%
Tryptophane	1.6%
Tyrosine	3.1%
Valine	4.5%
Ash	3.5%

0.1 parts sorbic acid and 0.1 parts bactericide (e.g. propyl *p*-hydroxy benzoate) are dissolved in water and maintained at 70°C.

The aqueous phase (b) is transferred to a jacketed kettle provided with means for circulating cooling water. The fatty phase (a) is emulsified, for example by means of a colloid mill or homogeniser and slowly introduced into the aqueous phase. The emulsion is then cooled to 35°C and optionally perfumed.

Example 2

Phases (a) and (b) are prepared as described in Example 1, and emulsified, but in reverse order. The aqueous phase (b) is added slowly to the fatty phase, giving a

heavy, coarse water-in-oil emulsion. If addition of water is continued, the emulsion breaks up and the inversion point is reached; the mixture then becomes an oil-in-water emulsion and the remainder of the aqueous phase is added. A stable, brilliant emulsion is obtained.

EXAMPLE 3

25 parts of pure petroleum jelly (Paraffinium perliquidum Ph.H.V., d_{20}=0.855—0.87, maximum viscosity 0.3 poise, containing no traces of paraffins, inorganic impurities, unsaturated hydrocarbons, alkalis, acids, sulphur linkages, saponifiable fats or waxes) are mixed at 65° with 6 parts of lanoline (adeps lanae anhyd.) and 2 parts of cetyl alcohol. 0.1 parts of butyl-hydroxy anisole (antioxidant) and 0.1 parts of hexachlorophene (bactericide) are added to the clear solution. This mixture constitutes the fatty phase. An emulsifying agent having a suitable hydrophilic-lipophilic balance for the stability of the product, for example a mixture of 4.75 parts of polyoxyethylene sorbitan trioleate and 0.25 parts of polyoxyethylene sorbitan monostearate, is then added to the fatty phase. The aqueous phase is prepared by dissolving 5 parts of lactalbumin hydrolysate having the composition given in Example 1 and 0.1 parts of sorbic acid (preservative) in 60 parts of double-distilled water. This solution is maintained at 65°C.

The emulsion is prepared as described in Example 1; the fatty phase, also at 65°C, is slowly added with cooling to the aqueous phase whilst employing a suitable emulsifying apparatus.

WHAT WE CLAIM IS:—

1. Compositions adapted for topical administration comprising an enzymatic lactalbumin hydrolysate as active ingredient in conjunction with an inert carrier, said carrier being a oil-in-water type emulsion in which the active ingredient is present in the aqueous phase.

2. Compositions according to claim 1 containing 1.0 to 10.0% by weight of active ingredient.

3. Compositions according to claim 2 containing 2.5 to 5.0% by weight of active ingredient.

4. Compositions according to any one of claims 1 to 3 wherein the active ingredient has the following approximate composition, expressed in percentages by weight:—

Alanine	4.7
Ammonia	1.3
Arginine	3.0
Aspartic acid	9.5
Cystine	1.5
Glutamic acid	16.3
Glycine	1.7
Histidine	1.7
Iso-leucine	4.8
Leucine	10.4
Lysine	9.0
Methionine	1.8
Phenylalanine	3.0
Proline	3.9
Serine	3.7
Threonine	4.3
Tryptophane	1.6
Tyrosine	3.1
Valine	4.5
Ash	3.5

5. Compositions according to any one of the preceding claims wherein the pH of the aqueous phase is 5.9 to 6.2.

6. Compositions according to any one of the preceding claims wherein the carrier comprises at least one of the following substances, namely cetyl alcohol, lanolin, petroleum jelly, liquid paraffin and a polyoxyethylene sorbitan ester.

7. Composition according to any one of the preceding claims also comprising an antimicrobial, bactericidal and/or fungicidal agent.

8. Compositions according to any one of the preceding claims also comprising an antioxidant, a colouring matter and/or a perfume.

9. Compositions according to any one of the preceding claims in the form of creams, ointments, lotions, milks, aerosol sprays or aerosol foams.

10. Compositions as claimed in claim 1 substantially as herein described with reference to any one of the examples.

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